CLAIMS

We claim:

1. An integrated circuit amplifier comprising:

a signal input element for receiving an input signal;

a first amplifying element having an input and an output wherein the input is operatively coupled to receive the input signal;

a phase shifting element having an input and an output wherein the input is operatively connected to receive the input signal;

an second amplifying element having an input and an output wherein the input is operatively coupled to receive the phase shifted signal from the phase shifting element;

an impedance transformer element having an input and an output wherein the input is operatively coupled to receive the first amplifier output; and

a signal output element coupled to the output of the second amplifier and the output of the impedance transformer element for providing an output of the integrated circuit amplifier.

2. The integrated circuit set forth in claim 1 wherein the integrated circuit is a monolithic microwave integrated circuit (MMIC).

3. The integrated circuit set forth in claim 1 wherein the integrated circuit is a radio frequency integrated circuit (RFIC).

4. The integrated circuit amplifier set forth in claim 1 wherein the input signal is a radio frequency (RF) input signal.

5. The integrated circuit amplifier set forth in claim 1 wherein the phase shifting element is adapted to shift the phase of the input signal approximately 90 degrees.

6. The integrated circuit amplifier set forth in claim 1 wherein the impedance transformer element is a quarter wavelength impedance transformer element.

7. The integrated circuit amplifier set forth in claim 1 wherein the impedance transformer is a lumped element of inductance and capacitance elements.

8. The integrated circuit amplifier set forth in claim 1 wherein the second amplifying element includes a bias circuit for biasing an amplifier transistor having a control terminal, a current-sink terminal, and a current-source terminal.

9. The integrated circuit amplifier set forth in claim 8 wherein the bias circuit comprises:

a bias transistor including a control terminal, current-sink terminal, and a current-source terminal;

a first DC input port connected to the current sink terminal of the bias transistor;

a first resonator element operatively coupled to the current-sink terminal of the bias transistor and ground;

a second DC input port connected to the control terminal of the bias transistor;

a diode element operatively coupled to the control terminal of the bias transistor and ground;

a second resonator element operatively coupled to the control terminal of the bias transistor and ground; and

a resistive element operatively coupled to the current source terminal of the bias transistor and the control terminal of the amplifier transistor.

10. The integrated circuit amplifier set forth in claim 9 wherein the bias transistor is one of a BJT, an HBT and a FET.

11. The integrated circuit amplifierset forth in claim 9 wherein the amplifier transistor is one of a BJT, an HBT and a FET.

12. The integrated circuit amplifier set forth in claim 9 wherein the first resonator is an RLC circuit.

13. The integrated circuit amplifier set forth in claim 9 wherein the diode element comprises a plurality of diodes.

14. The integrated circuit amplifier set forth in claim 9 wherein the second resonator is an RLC circuit.

15. The integrated circuit amplifier set forth in claim 9 wherein the resistive element is a resistor.

16. The integrated circuit amplifier set forth in claim 9 wherein the resistive element is an RLC circuit.

17. An integrated circuit for creating a single chip Doherty-type transformer, the integrated circuit comprising:

means for receiving an input signal;

means for amplifying the input signal to generate a first amplified signal;

means for transforming the first amplified signal;

means for altering the electrical characteristics of the input signal;

means for amplifying the altered signal to generate a second amplified signal; and

means to combine the first amplified signal and the second amplified signal.

18. The integrated circuit set forth in claim 17 wherein the input signal is a radio frequency (RF) input signal.

19. The integrated circuit set forth in claim 17 wherein the means for transforming the first amplified signal is a quarter wavelength impedance transformer.

20. The integrated circuit set forth in claim 17 wherein the means for altering the electrical characteristics of the input signal includes means for shifting the phase of the input signal.

21. The integrated circuit set forth in claim 17 wherein the means for amplifying the altered signal further comprises an amplifier and a bias circuit adapted to automatically react to an applied power.

22. The integrated circuit set forth in claim 17 wherein the means for amplifying the altered signal further comprises means for tailoring a transistor operating point.

23. The integrated circuit set forth in claim 22 wherein the means for tailoring the transistor operating point is a bias circuit.